CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS)

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART					
	C	ARSE-GR	AINED SOILS		
(more than 50% of material is larger than No. 200 sieve size.)					
Clean Gravels (Less than 5% fines)					
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	G		graded gravels, gravel-sand res, little or no fines		
	G S		y-graded gravels, gravel-sand res, little or no fines		
	Gravels with fines (More than 12% fines)				
)	M Silty g	ravels, gravel-sand-silt mixtures		
	G	Claye mixtu	y gravels, gravel-sand-clay es		
Clean Sands (Less than 5% fines)					
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	s		graded sands, gravelly sands, r no fines		
	S		/ graded sands, gravelly sands, r no fines		
	Sands with fines (More than 12% fines)				
	s	M Silty s	ands, sand-silt mixtures		
	s	Claye	y sands, sand-clay mixtures		
FINE-GRAINED SOILS					
(50% or more of material is smaller than No. 200 sieve size.)					
SILTS AND CLAYS Liquid limit less than 50%	M	L flour,	anic silts and very fine sands, rock silty of clayey fine sands or clayey with slight plasticity		
	С	_ plastic	anic clays of low to medium city, gravelly clays, sandy clays, lays, lean clays		
	0		nic silts and organic silty clays of asticity		
SILTS AND CLAYS Liquid limit 50% or greater	M		anic silts, micaceous or naceous fine sandy or silty soils, c silts		
	c	H Inorga	anic clays of high plasticity, fat		
			nic clays of medium to high city, organic silts		
HIGHLY ORGANIC SOILS	<u>√</u> √ P	Peat a	and other highly organic soils		

I APODATORY CLASSIFICATION CRITERIA					
LABORATORY CLASSIFICATION CRITERIA					
GW	GW $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3				
GP	Not meeting all gradation requirements for GW				
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols			
GC	Atterberg limits above "A" line with P.I. greater than 7				
sw	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3				
SP	Not meeting all gradation requirements for GW				
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are			
sc	Atterberg limits above "A" line with P.I. greater than 7	borderline cases requiring use of dual symbols.			

